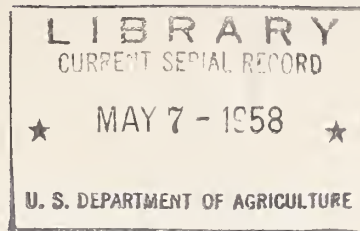


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UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE

PUBLICATIONS AND PATENTS  
OF THE  
EASTERN UTILIZATION RESEARCH AND DEVELOPMENT DIVISION

July - December 1956

Single copies of available reprints may be obtained on request. At the time this list was prepared, the following, marked (\*), were not available:

1036, 1049, 1066

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Publications and patents of the Eastern Utilization Research Branch issued before 1951 are listed in AIC-180 and Supplements 1 to 6; publications and patents from 1951 through June 1954 are listed in AIC-320 and Supplements 1 to 6; publications from July 1954 through December 1956 are listed in ARS-73-6 and Supplements 1 to 4.

This list includes an index which covers AIC-180 and supplements, AIC-320 and supplements, and ARS-73-6 and supplements.

August 1957



## PUBLICATIONS

1027. *Ackerman, Bernard and Jordan, T. A., (Fatty Acid Division, Association of American Soap and Glycerine Producers, Inc.) and Eddy, C. Roland, and Swern, Daniel (EURDD)*

PHOSPHORUS DERIVATIVES OF FATTY ACIDS. I. PREPARATION AND PROPERTIES OF DIETHYL ACYLPHOSPHONATES. *Journal of the American Chemical Society*, 78, 4444-4447 (1956).

A series ( $C_4$ - $C_{18}$ ) of diethyl acylphosphonates was prepared and certain physical properties were determined. Evidence obtained from calculation of molar refractions, infrared spectroscopy, and polarography shows that the new compounds exist in a true phosphonate form. The diethyl acylphosphonates are easily hydrolyzed.

1028. *Ackerman, Bernard, and Jordan, T. A. (Fatty Acid Division Producers' Council of Association of American Soap and Glycerine Producers, Inc.) and Swern, Daniel (EURDD)*

PHOSPHORUS DERIVATIVES OF FATTY ACIDS. II. DIETHYL ACYLOXYETHYLPHOSPHONATES. *Journal of the American Chemical Society*, 78, 6025-6027 (1956).

A series of diethyl acyloxyethylphosphonates has been prepared from triethyl phosphite and bromoethyl esters of fatty acids. Hydrolysis under milk acid conditions occurs preferentially at the carboxylic ester group with the formation of the parent fatty acid.

1029. *Anonymous*

FACTS ABOUT PASTEURIZATION OF MILK. U. S. Dept. Agr., Leaflet No. 408; (December 1956).

This leaflet discusses the nature of pasteurization and its desirability, answers some misconceptions about pasteurization, and gives directions for the pasteurization of milk at home.

1030. *Brice, B. A., Turner, A., Jr., and White, J. W., Jr.*

GLASS COLOR STANDARDS FOR EXTRACTED HONEY. *Journal of the Association of Official Agricultural Chemists*, 39, 919-937 (1956).

New official glass color standards and convenient color comparators are described for use in the classification of extracted honey for color. Spectrophotometric data are given for extracted honey, caramel solutions, and the six glass color standards. Complete specifications for the latter include colorimetric data in the CIE coordinate system.

1031. *Buch, M. L., Dryden, E. C., Hills, Claude H., (EURDD) and Oyler, James R. (Knouse Foods Cooperative, Inc.)*

ORGANOLEPTIC EVALUATION OF APPLESAUCE FORTIFIED WITH ESSENCE AND CITRIC ACID. *Food Technology*, 10, 560-562 (1956).

The flavor of applesauce was improved by the addition of apple essence and by small amounts of citric acid. Essence from peels and cores, a by-product of sauce manufacture, proved to be as good for this purpose as essence from whole apples. A consumer panel was used to determine the concentration of added essence required. The application of these results to commercial practice is discussed.

1032. *Clarke, I. D., Harris, E. H., Jr., and Filachione, E. M.*

TANNING STUDIES WITH AN EPOXY RESIN. PRELIMINARY EVALUATION OF THE LEATHER. *Journal of the American Leather Chemists Association*, 51, 574-583 (1956).

Steerhide blocks, split to 8 ounces, were tanned with an epoxy resin, Epon 562, and changes in the crust-dry leather relative to acetone-dehydrated stock were noted. The weight and thickness gain and the loss in area were comparable to those noted with chrome-tanned stock. Tanning with the epoxy resin resulted in lower stretch and greater stiffness in flexure than did chrome or vegetable tanning. The epoxy resin tannage also resulted in a greater loss of strength as compared to chrome and vegetable tannage. The leather obtained upon tanning with Epon 562 showed reversible shrinkage (Ts 85°C.). The properties discussed above were not significantly altered upon boiling this leather in water for one minute or upon retannage with chrome or vegetable tannin.

1033. *Coleman, Joseph E., Ricciuti, C., and Swern, Daniel*

IMPROVED PREPARATION OF 9(10), 10(9)-KETOHYDROXYSTEARIC ACIDS BY OXIDATION OLEIC ACID WITH POTASSIUM PERMANGANATE IN NEUTRAL SOLUTION. *Journal of the American Chemical Society*, 78, 5342-5345, (1956).

The mild oxidation of oleic acid with dilute aqueous potassium permanganate has been reinvestigated and the marked effect of pH in determining the course of the reaction has been interpreted. When the pH is controlled in the range of 9.0-9.5, 65-75% conversions to 9(10), 10(9)-ketohydroxystearic acids are obtained.

1034. *Curran, H. R. and Evans, F. R.*

THE EFFECTS OF BETA-PROPIOLACTONE ON BACTERIAL SPORES. *Journal of Infectious Diseases*, 99, 212-218 (1956).

Washed spores were seeded into different substrates, treated with Betaprone, with or without activation of the spores by mild heat. Colony spore counts were made before and after treatment. Betaprone (0.3 percent) rapidly killed resistant spores of *Bacillus subtilis*, *Bacillus cereus*, *Bacillus stearothermophilus*, *Clostridium botulinum* and P. A. 3679, in water, nutrient broth and skim milk. The spores did not die at a uniform rate, although the death rate was essentially linear for 99-plus percent destruction; rapid and complete destruction of spores occurred only at relatively high concentrations of Betaprone. At 37°C., 0.5 to 1.5 percent of Betaprone rapidly sterilized nutrient broth, heavily seeded with spores ( $1 \times 10^6$ /ml.). A near-to-normal temperature coefficient was indicated. Spores, previously treated with Betaprone were more susceptible to heat at 100°C., than were spores not previously exposed to the drug. In aqueous substrates, at room temperature and above, Betaprone is rapidly converted into compounds (chiefly hydracrylic acid), which have no sporocidal activity. Limitations and possible utility of the drug are discussed.



1035. *Fee, Jeanne G., Calhoun, R. R., and Witnauer, L. P.*

INSTRUMENT FOR MEASURING THERMAL AND ELASTIC BEHAVIOR OF HIDE AND MODIFIED HIDE MATERIALS. *Journal of the American Leather Chemists Association*, 51, 530-541, (1956).

An instrument is described which was designed and constructed in this Laboratory for the purpose of investigating hydrothermal and elastic properties of hide and modified hide materials. The apparatus incorporates a torsion producing and measuring component and an adjustable scale and torsion balance for measuring changes in length under variable load when necessary. The measurements can be made in air or liquid media as a function of temperature as desired. The apparatus has the following qualities: It is versatile and measures fundamental properties over a useful range of temperature, it is simple in operation, it is suitable for routine use, and it requires specimens which are easy to prepare. Methods for measuring temperature and amount of shrinkage, effects of tanning on torsional stiffness and stress-strain behavior before and after shrinkage with this instrument are discussed and examples of data obtained are given.

- \*1036. *Gordon, William G.*

THE DETERMINATION OF AMINO ACIDS BY COLUMN CHROMATOGRAPHY ON ION EXCHANGE RESINS. Chapter in "Amino Acid Handbook, Methods and Results of Protein Analysis," Charles C. Thomas, Springfield, Ill., 1956 (p. 111-135).

The development of column chromatography as a method for the qualitative and quantitative determination of amino acids is discussed. The procedure of Moore and Stein (1951), which makes use of an ion-exchange resin for the quantitative analysis of mixtures of amino acids, is described in detail. Sufficient experimental directions are given so that the description may be used as a laboratory manual. Applications of the method to the quantitative amino acid analysis of proteins and foods are reviewed.

1037. *Heisler, E. G., Hunter, Ann S., Siciliano, James, and Treadway, R. H.*

SOLUTE AND TEMPERATURE EFFECTS IN THE PERVAPORATION OF AQUEOUS ALCOHOLIC SOLUTIONS. *Science*, 124(3211), 77-79, (1956).

Pervaporation, defined as the passage of a liquid through a semi-permeable membrane (cellophane used) and subsequent evaporation of the liquid, was used in the laboratory to dehydrate mashed potatoes. The potato solubles caused quite different results to be obtained than when pure aqueous alcohol was used. Experiments with aqueous ethanol, using different solutes and at two temperatures, indicated that the water content of the pervaporated vapor (1) apparently parallels the water solubility and ethanol insolubility of the added solute, and (2) increases with an increase in temperature.

1038. *Hoover, Sam R.*

TRANSFORMATIONS OF CARBON BY MICROORGANISMS. *Industrial and Engineering Chemistry*, 48, 1419-1420 (1956).

A review of the application of the principles of bacterial metabolism in industrial waste treatment.

1039. *Jasewicz, Lenore and Porges, Nandor*

BIOCHEMICAL OXIDATION OF DAIRY WASTES. VI. ISOLATION AND STUDY OF SLUDGE MICROORGANISMS. *Sewage and Industrial Wastes*, 28, 1130-1136 (1956).

The assimilative and endogenous sludges of a laboratory dairy waste aeration disposal system are quantitatively and qualitatively investigated for differences in microscopic biota with particular emphasis on the relative importance and possible function of each type of microorganism in the aerobic treatment of dairy waste.

1040. *Kaunitz, Hans, Slanetz, Charles A., and Johnson, R. E. (Columbia University), and Knight, H. B., Saunders, D. H., and Swern, Daniel (EURDD)*

BIOLOGICAL EFFECTS OF THE POLYMERIC RESIDUES ISOLATED FROM AUTOXIDIZED FATS. *Journal of the American Oil Chemists Society*, 33, 630-634 (1956).

Lard and cottonseed oil, aerated at 95°C. for 200 hours, were molecularly distilled and the residue fractions, nonvolatile at 275°C., were employed in rat-feeding studies. Diets with 20 percent of polymeric residue led to diarrhea and rapid death, but when this residue was reduced to 10 percent, most of the animals gradually were able to tolerate it. Addition of fresh fat to the polymeric residues decreased their toxicity.

1041. *Kaunitz, Hans, Slanetz, C. A., Johnson, R. E., and Guilmain, J. (Columbia University), and Knight, H. B., Saunders, D. H. and Swern, Daniel (EURDD)*

NUTRITIONAL PROPERTIES OF THE MOLECULARLY DISTILLED FRACTIONS OF AUTOXIDIZED FATS. *Journal of Nutrition*, 60, 237-244 (1956).

Molecular distillation of autoxidized lard and autoxidized cottonseed oil yielded distillates which were only slightly less effective than lard in supporting the growth of weanling rats. In contrast, the molecular distillates had a markedly lower protective effect than fresh fat in neutralizing the growth-retarding effect of the polymeric residues from autoxidized fats.

1042. *Kountz, R. Rupert (Penna. State University) and Porges, Nandor (EURDD)*. Work done under Research and Marketing Act Contract.

DAIRY WASTE TREATMENT BY AERATION. U. S. Dept. Agr., Agr. Res. Ser. Circ. ARS-73-16; 10 pp. (October 1956).

A report of work done under contract at the Pennsylvania State University presenting in a concise, simple and complete manner, information on the treatment of dairy waste as derived from this cooperative study. The items discussed are; (1) waste characteristics, (2) relation of treatment cost to volume and strength of waste, (3) basic theory of the treatment process, (4) aeration, (5) process development, and (6) waste-treatment planning.



1043. *Kirkwood, John G. (Yale University) and Timasheff, Serge N. (EURDD).*

THE EFFECT OF IONIZATION ON THE LIGHT SCATTERING OF ISOIONIC PROTEINS.  
Archives of Biochemistry and Biophysics, 65, 50-57 (1956).

The effect on light scattering of progressive ionization with dilution of isoionic proteins has been examined. An equation is developed for the calculation of this effect. It is found that, in the case of bovine serum albumin, this can take on a very large magnitude at low concentration if dilution is carried out with distilled water. If the protein is kept close to its isoionic pH by using  $1 \times 10^{-5}$  M HCl as diluting agent for BSA, or if the isoionic point is close to pH 7.0, as is the case with conalbumin, this effect is greatly suppressed and causes the light scattering plot to go through a maximum point at very high dilution.

1044. *Krewson, C. F., and Drake, T. F. (EURDD) and Mitchell, J. W., and Preston, W. J., Jr. (Crops Research Division).*

PRELIMINARY SCREENING TESTS OF AMINO ACID DERIVATIVES OF 2-(2',4'-DICHLORO-PHENOXY) PROPIONIC ACID. Journal of Agricultural and Food Chemistry, 4, 690-693 (1956).

Since it has been found that the optical configuration of compounds affecting plant-growth is important to their selectivity, a series of new amino acid derivatives of 2-(dichlorophenoxy)-propionic acid in their *D*-, *L*- and *DL*- forms has been synthesized and these compounds have been screened for their effectiveness as plant growth regulators. This investigation was undertaken specifically to widen the possibilities for the utilization of amino acids, and in general to elucidate the mode of action of growth regulators. The derivatives of *DL*- and *L*-amino acids proved generally to be active plant-growth regulators with high selectivity; those of the *D*-amino acids were almost completely lacking in growth-regulating properties during the test period. A variety of notable differences in behavior patterns are characteristic of this 2-(2,4-dichlorophenoxy)-propionic acid series; these are in sharp contrast to generalities previously reported for other halogenated phenoxy acid series. These derivatives are easily prepared and analyzed, and possess sharp melting points; hence they may be useful in the characterization of amino acids.

1045. *Lee, Leonard A.*

DETERMINATION OF FREE AND COMBINED FORMALDEHYDE USING MODIFIED CHROMOTROPIC ACID PROCEDURE. Analytical Chemistry, 28, 1621-1623 (1956).

Under suitable conditions piperine, the principal substance associated with the sharp taste of pepper, can be determined colorimetrically as formaldehyde by a modified chromotropic acid procedure. The conditions selected are also advantageous for determination of free or combined formaldehyde in other compounds.

1046. *Lee, Leonard A. and Ogg, Clyde L.*

IMPROVED APPARATUS AND METHOD FOR THE DETERMINATION OF THE VOLATILE OIL CONTENT OF SPICES. Journal of the Association of Official Agricultural Chemists, 39, 806-816 (1956).

Modifications made in the apparatus and procedure commonly used for volatile oil determination have led to a number of improvements, including easier manipulation, greater accuracy, increased precision, and a shortening of analysis time.

1047. *Mellon, Edward F. and Korn, Alfred H.*

THE NETWORK STRUCTURE OF ELASTIN IN THE GRAIN LAYER OF CATTLE HIDE.  
Journal of the American Leather Chemists Association, 51, 469-479 (1956).

The grain layer of bull hide was analyzed by stratigraphic sectioning. The elastin content determined at various distances from the grain surface showed that the elastin was generally distributed throughout the grain layer as a three-dimensional network.

1048. *Morris, S. G., Magidman, P., Luddy, F. E., and Riemenschneider, R. W.*

BEEF TALLOW IN SHORTENING PREPARATIONS. Journal of the American Oil Chemists Society, 33, 353-355 (1956).

A number of shortenings were prepared by different procedures from various mixtures of tallow and cottonseed oil. A comparison of physical properties and cake volume tests indicated that some of these shortenings compared well with standard vegetable shortenings.

- \*1049. *Porges, Nandor, Jasewicz, L. and Hoover, Sam R.*

PRINCIPLES OF BIOLOGICAL OXIDATION. Published in book entitled "Biological Treatment of Sewage and Industrial Wastes, vol. 1, Aerobic Oxidation." Edited by McCabe and Eckenfelder, Reinhold Publishing Corp., 35-48 (1956).

Studies leading to the development of a rapid aeration process for waste disposal are reviewed and discussed. Essentially there are two major demands for oxygen. The rapid assimilation phase requires 37.5 percent of the theoretical amount of oxygen in a very short growth period. The remaining oxygen is used very slowly during the endogenous phase, requiring about 100 hours to oxidize the excess sludge. Equations and calculations are presented.

1050. *Rogers, L. V., Mucha, T. J., and Bell, R. W.*

COMPARISON OF BAKING QUALITY OF FROZEN CONDENSED AND SPRAY-DRIED SKIMMILK. Journal of Dairy Science, 39, 965-970 (1956).

The baking quality of frozen condensed skim milks having a high solids content and prepared from low- and high-heat-treated skim milk was compared with that of spray-dried skim milk obtained from other portions of the same heat-treated skim milk. Although the physical characteristics of the frozen samples deteriorated markedly, they were nearly as satisfactory sources of milk solids-not-fat for breadmaking as comparable spray-dried samples. Heat treatment was the primary factor in determining baking quality.

1051. *Scott, William E., Doukas, Harry M., and Schaffer, Paul S.*

THE USE OF SODIUM TETRAPHENYLBORON AS A MEANS OF IDENTIFYING AND ISOLATING ALKALOIDS. Journal of the American Pharmaceutical Association, Scientific Edition, 45, 568-570 (1956).

The use of a new reagent, sodium tetraphenylboron, as a means of identifying alkaloids is described. Methods are given for isolating alkaloid complexes and for determining their physical constants as an aid in the identification of the alkaloids. A simple method of recovery of the alkaloids is also given.

1052. *Siciliano, James, Woodward, C. F., Treadway, R. H. and Heisler, E. G.*

POTATO "NUTS" -- A NEW TYPE OF SNACK. U. S. Dept. Agr., Agr. Research Service Circ. ARS-73-15; 3 pp. (November 1956).

Potatoes sliced into 1/4-inch cubes and fried in deep fat make an attractive snack consisting of golden brown pieces crisp at the surface and firm at the center. Conditions used in the laboratory-scale preparation of this product are given.

1053. *Siedler, A. J., Enzer, Erica, and Schweigert, B. S. (American Meat Institute Foundation), and Riemenschneider, R. W. (EURDD).* Work done under Research and Marketing Act Contract.

VITAMIN A AND CAROTENE STABILITY IN FEEDS CONTAINING ANTIOXIDANT-TREATED ANIMAL FATS. *Journal of Agricultural and Food Chemistry*, 4, 1023-1029 (1956).

Experimental storage tests were conducted on commercial poultry feeds to which animal fats containing various antioxidants had been added. The antioxidants were 2-(and 3-)-tert-butyl-4-hydroxyanisole(BHA); 6-ethoxy-2, 2,2-trimethyl-1,2-dihydroquinoline (Santoquin); BHA plus 2, 5-di-tert-amyl-hydroquinone (DAH); 2,6-di-tert-butyl-p-cresol (BHT); BHA plus BHT; and N, N'diphenyl-p-phenylene diamine (DPPD). Santoquin, DPPD, BHT, and BHA plus BHT were found most effective in retarding loss of vitamin A and carotene in the stored feeds.

1054. *Silbert, Leonard S., Jacobs, Zelda B., Palm, William E., Witnauer, Lee P., Port, William S. and Swern, Daniel*

VINYL EPOXYSTEARATE: PREPARATION, POLYMERIZATION AND PROPERTIES OF POLYMERS AND COPOLYMERS. *Journal of Polymer Science*, 21, 161-173 (1956).

Vinyl epoxystearate was synthesized by the reaction of vinyl oleate and percarboxylic acids, and the kinetics of its formation was studied. The mechanical and thermal properties of copolymers of vinyl chloride and vinyl epoxystearate were compared with compositions of polyvinyl chloride and butyl epoxystearate.

1055. *Steyermark, Al, Alber, H. K., Aluise, V. A., Huffman, E. W. D., Jolley, E. L., Kuck, J. A., Moran, J. J., and Ogg, C. L.* (Committee on Microchemical Apparatus, Division of Analytical Chemistry, American Chemical Society).

REPORT ON RECOMMENDED SPECIFICATIONS FOR MICROCHEMICAL APPARATUS - VOLUMETRIC GLASSWARE, FLASKS, PIPETS, AND CENTRIFUGE TUBES. *Analytical Chemistry*, 28, 1993-1995 (1956).

A new type microvolumetric flask is described which combines convenience in use with accuracy. Special measuring pipets have been designed for use with these flasks.

1056. *Strolle, Eugene O., Eskew, Roderick K. and Claffey, Joseph B.*

A NEW RAPID EVAPORATOR FOR MAKING HIGH-GRADE MAPLE SIRUP. U. S. Dept. Agr., Agr. Research Service Circ. ARS-73-13; 6 pp. (July 1956).

A steamheated ultrarapid evaporator is described for making maple sirup with lighter color and higher flavor than can be obtained by processing in the conventional way.



1057. *Strolle, Eugene O., Cording, James, Jr., and Eskew, Roderick K.*

AN ANALYSIS OF THE OPEN-PAN MAPLE-SIRUP EVAPORATOR. U. S. Dept. Agr., Agr. Research Service Circ. ARS-73-14; 14 pp. (October 1956).

An engineering analysis was made of the mechanism of mass flow and heat transfer in the open-pan maple sirup evaporator. Sugar concentrations, pH, residence times, evaporative rates, heat transfer coefficients, and color and flavor development in the various pan sections were determined.

1058. *Swift, C. E. and Ellis, Rex*

THE ACTION OF PHOSPHATES IN SAUSAGE PRODUCTS. I. FACTORS AFFECTING THE WATER RETENTION OF PHOSPHATE-TREATED GROUND MEAT. Food Technology, 10, 546-552 (1956).

The effect on the water retention of ground meat of varying ionic strength, pH, time and temperature, and of introducing certain ions was studied. The additives employed included sodium chloride, pyrophosphates-sodium chloride and orthophosphates-sodium chloride mixtures and, to a limited extent, calcium and magnesium chlorides and potassium iodide. Some "specific" effects of treatments with additives were investigated. Data were obtained on the effect of varying pH and ionic strength on the solubility of proteins and on losses produced by evaporation from treated samples heated at 167°F. (75°C.).

1059. *Talley, Eugene A., Fitzpatrick, Thomas J., and Porter, William L.*

THE FORMATION OF 4-CARBOXY-2-AZETIDINONE FROM ASPARAGINE IN PHOSPHATE BUFFER. Journal of the American Chemical Society, 78, 5836-5837 (1956).

The beta-lactam, 4-carboxy-2-azetidinone was synthesized from L and DL-asparagine by cyclization in phosphate buffer at pH 6.7 at 100°C. The compound is ninhydrin negative, is stable to acid hydrolysis but labile in concentrated ammonium hydroxide at room temperature. In addition to the lactam and aspartic acid the reaction products include four compounds, as yet unidentified, which are ninhydrin positive.

1060. *Thompson, John F. and Morris, Clayton J. (U. S. Plant, Soil and Nutrition Laboratory) and Zacharius, Robert M. (EURDD).*

THE ISOLATION OF (-) S-METHYL-L-CYSTEINE FROM BEANS (*PHASEOLUS VULGARIS*). Nature, 178, 593 (1956).

A new naturally-occurring amino acid, S-methyl-L-cystein, has been isolated from the seeds of kidney beans (*Phaseolus Vulgaris*).

1061. *Timasheff, Serge N., (EURDD), and Sturtevant, Julian M. (Yale University) and Bier, M. (Fordham University).*

ON THE ELECTROPHORETIC HETEROGENEITY OF TRYPSIN. Archives of Biochemistry and Biophysics, 63, 243-246 (1956).

Crystalline trypsin was separated into its electrophoretic components in a pH 4.7 calcium acetate buffer of 0.1 ionic strength in a Klett Tiselius electrophoresis partition cell. Three fractions were isolated: 1. Pure rapidly migrating component; 2. Fraction enriched with respect to slow component; 3. Very slowly migrating component (comprising ca. 1 percent of the original material). The activities with respect to hemoglobin, BAEE and TSAEE were tested. It was found that the two main components are equally active while the minor component (probably composed of break-down products) contains little activity.

1062. *Townend, Robert, and Timasheff, Serge N.*

THE pH DEPENDENCE OF THE ASSOCIATION OF BETA-LACTOGLOBULIN. Archives of Biochemistry and Biophysics, 63, 482-484 (1956).

The association of beta-lactoglobulin at low temperature was studied as a function of pH in the region between pH 3.4 and 5.5. It was found that this protein aggregated in the pH region, with maximal formation of heavy component at ca. pH 4.5. Below pH 3.5 and above pH 5.1 no aggregation occurs. The sedimentation constants of the light and heavy components suggest that the aggregate is a dimer.

1063. *Treadway, R. H.*

RECENT DEVELOPMENTS IN PROCESSED POTATO PRODUCTS. American Potato Journal, 33, 300-312 (1956).

Chips remain as the largest single processing outlet for potatoes. More new products have been commercialized recently in the frozen field than in any other category. These include potato puffs, potato patties, whipped mashed potatoes, blanched potato dice, and potato soup. Improved forms of dehydrated mashed potatoes, i.e., granules and flakes, have resulted from concentrated research and development activities.

1064. *Turkot, Victor A., Eskew, Roderick K., and Aceto, Nicholas C.*

A CONTINUOUS PROCESS FOR DEHYDRATING FRUIT JUICES. Food Technology, 10, 604-606 (1956).

Powdered apple, grape, and cherry juice products of high quality have already been made by the authors using a batch technique in which the juices are shelf-dried under vacuum. To reduce costs, a continuous drying process has now been developed using a mechanically agitated thin-film evaporator operated at moderate vacuum and high temperature with rapid throughput. Moisture is reduced to 2 percent while the product is molten. Aroma is restored by injecting high-fold essence into the effluent stream. The product is quickly reduced to thin flakes on chilling rolls. So far apple, grape, and cherry juice powders containing added sucrose have been produced on a pilot-plant scale.



1065. *Underwood, J. C., Lento, H. G., Jr., and Willits, C. O.*

TRIOSE COMPOUNDS IN MAPLE SIRUP. *Food Research*, 21, 589-597 (1956).

Steam distilling of maple sirup has yielded compounds which have been isolated as their 2, 4-dinitrophenylhydrazone derivatives and which compare closely to like derivatives of such compounds as acetol, methyl glyoxal, glyceraldehyde, and reductone. The possibility is strongly indicated that one or more of these trioses are formed by alkaline degradation of the invert sugar in the maple sap and are a part of the mechanism of the flavor and color development in maple sirup.

- \*1066. *Weil, J. K., Bistline, R. G. Jr., and Stirton, A. J.*

ALPHA-SULFOPALMITIC ACID (2-Sulfohexadecanoic Acid). *Organic Synthesis*, 36, 83-86 (1956).

A description of a laboratory method for the synthesis of alpha-sulfolauric, alpha-sulfo-myristic, alpha-sulfopalmitic, alpha-sulfostearic, and alpha-sulfobehenic acids from the reaction of sulfur trioxide with the saturated fatty acids.

1067. *Weil, J. K., and Stirton, A. J.*

CRITICAL MICELLE CONCENTRATIONS OF ALPHA-SULFONATED FATTY ACIDS AND THEIR ESTERS. *Journal of Physical Chemistry*, 60, 899-901 (1956).

Critical micelle concentration (c.m.c.) values were measured for alpha-sulfo-myristic, palmitic, and stearic acids, sodium alkyl alpha-sulfopalmitates and stearates, and disodium 2-sulfoethyl alpha-sulfopalmitate and stearate. The c.m.c. values determined by conductance, surface tension, and dye titration methods are found to decrease with increased molecular weight and to increase with the addition of a second hydrophilic group. A correlation with detergent properties is indicated.

1068. *Whittenberger, R. T. and Hills, C. H.*

BRUISING CAUSES CHERRY DISCOLORATION. *Canner and Freezer*, 123 (No. 4), 14-15, (1956).

The cherry industry is seriously concerned about discolored areas or scald blemishes that appear on cherries prior to processing. It is shown that the blemishes are really bruise marks, and that their final appearance depends largely on the temperature and duration of the post-bruising period.

1069. *Willits, C. O.*

REPORT ON METHODS FOR MAPLE PRODUCTS. *Journal of Association of Official Agricultural Chemists*, 39, 684-688, (1956).

A report on a collaborative study preliminary to establishing procedures for publishing in the A.O.A.C. Book of Methods for the determination of the degrees Brix and conductivity values for maple sirup.

1070. *Zittle, Charles A.*

SOLUBILITY TRANSFORMATION OF ALPHA-LACTALBUMIN. Archives of Biochemistry and Biophysics, 54, 144-151 (1956).

Alpha-Lactalbumin exists in two solubility forms, one insoluble in 2 M ammonium sulfate, the other soluble. The first form occurs in salt-free solutions, the second form appears when 0.1 M or less of a variety of salts is added. Alpha-Lactalbumin binds chloride ions, as shown by a shift in the pH of isoelectric precipitation, and it is suggested that the binding of anions brings about the solubility transformation.

1071. *Zittle, C. A., DellaMonica, E. S., and Custer, J. H.*

PRECIPITATION OF CALCIUM CASEINATE BY HEAT AND SUBSEQUENT REVERSAL.  
Journal of Dairy Science, 39, 1651-1659 (1956).

Calcium chloride added to 2 percent sodium or calcium caseinate solutions will decrease their viscosity. Up to a concentration of 0.012 *M*, this effect is not changed by heat. Above this concentration the caseinate solutions become more viscous on heating (90°C.), a change that is attributed to the formation of a colloidal precipitate. On standing at 25°C., the precipitate partly redissolves with a parallel reduction in viscosity.

1956  
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## PATENTS

*Copies of patents may be purchased from  
the United States Patent Office, Washington 25, D. C.*

*Cording, James, Jr. and Willard, Miles J. Jr.*

DRUM DRYING OF COOKED MASHED POTATOES. U. S. Patent No. 2,759,832, issued August 21, 1956.

*Hansen, John E. and Dietz, Thomas J.*

VULCANIZATION OF ACRYLIC ACID COPOLYMERS. U. S. Patent No. 2,772,251 issued November 27, 1956.

*Knight, Hogan B., Koos, Ronald E. and Swern, Daniel*

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*Leviton, Abraham*

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## INDEX

Index to publications listed in ARS-73-6 and Supplements 1 through 4, AIC-180 and Supplements 1 through 6, and AIC-320 and Supplements 1 through 6 (1939 through December 1956). The numbers refer to the numbers of the publications in the lists; for those with an asterisk, reprints were not available at the time the index was prepared.

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